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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of : Customer Number: 20277  
 Philip KELLER, et al. : Confirmation Number: 7973  
 Application No.: 09/336,709 : Tech Center Art Unit: 2644  
 Filed: June 21, 1999 : Examiner: J. F. Harold

For: SELF-CALIBRATION PROCEDURE IN PHYSICAL LAYER TRANSCEIVER FOR HOME  
TELEPHONE WIRE NETWORK

**TRANSMITTAL OF APPEAL BRIEF**

Mail Stop Appeal Brief  
 Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

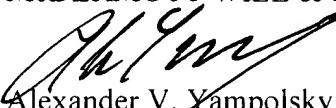
Sir:

Submitted herewith is Appellant's Appeal Brief in support of the Notice of Appeal filed  
 September 13, 2005. Please charge the Appeal Brief fee of \$500.00 to Deposit Account 500417.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby  
 made. Please charge any shortage in fees due under 37 C.F.R. 1.17 and 41.20, and in connection with  
 the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit  
 any excess fees to such deposit account.

Respectfully submitted,

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Docket No.: 064965-0107

PATENT



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**APPEAL BRIEF**

Mail Stop Appeal Brief  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed September 13, 2005, wherein Appellant appeals from the Primary Examiner's rejection of claims 1, 2 and 5-11.

**Real Party In Interest**

This application is assigned to Advanced Micro Devices, Inc. by assignment recorded on 06/21/1999, at Reel 010045, Frame 0475.

**Related Appeals and Interferences**

No other appeals or interferences are known to the Appellant, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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**Status of Claims**

Claims 1-17 are pending. Claims 3, 4 and 12-17 are found allowable subject to being rewritten in independent form. Claims 1, 2, 5-11 stand under final rejection, from which rejection this appeal is taken.

**Status of Amendments**

The application has not been amended after final Office Action

**Summary of Claimed Subject Matter**

The claimed subject matter relates to method and system for performing self-calibration in a physical layer transceiver for data communications over existing residential telephone line wiring.

Figure 1 illustrates a home telephone wire network 10 according to an embodiment of the invention, using existing residential wiring such as twisted pair telephone line wiring as network media. As shown in Figure 1, the network 10 supporting the Ethernet (IEEE 802.3) standard includes network stations 12a and 12b that are connected to a twisted pair telephone line wiring 14, via RJ-11 phone jacks 16a and 16b respectively. A telephone 18 connected to the RJ-11 phone jack 16c may continue to make phone calls while stations 12a and 12b are communicating.

As shown in Figure 1, each network station 12, for example a personal computer, printer, or intelligent consumer electronics device, includes a physical layer (PHY) transceiver 20, a media access (MAC) layer 22, and an operating system (OS) layer that performs higher layer function according to the OSI reference model.

A home telephone wire network environment of the present disclosure provides the advantage that existing telephone wiring in a home may be used to implement a home network environment. However, telephone lines are inherently noisy due to spurious noise caused by electrical devices in the

home, for example dimmer switches, transformers of home appliances, etc. In addition, the twisted pair telephone lines suffer from turn-on transients due to on-hook and off-hook and noise pulses from the standard Plain Old Telephone System (POTS) telephones, and electrical systems such as heating and air conditioning systems, etc.

An additional problem in telephone wiring networks is that the signal condition (i.e., shape) of a transmitted waveform depends largely on the wiring topology. Numerous branch connections in the twisted pair telephone line medium, as well as the different associated lengths of the branch connections, may cause multiple signal reflections on a transmitted network signal. Telephone wiring topology may cause the network signal from one network station to have a peak-to-peak voltage on the order of 10 to 20 millivolts, whereas network signals from another network station may have a value on the order of one to two volts. Hence, the amplitude and shape of a received pulse may be so distorted that recovery of transmit data from the received pulse becomes substantially difficult.

To address these problems, the physical layer transceiver 20 is capable of self-calibration to adjust the signal processing circuitry on the receive side to optimize accurate recovery data from the transmitted network signals. In particular, the improvement of reception characteristics, for example, selecting an optimum gain of receiving circuits enables the transmitted data packet to be more reliably received by a receiving network station, reducing the bit error rate of received data packets.

As shown in Figure 3, the physical layer transceiver 20 includes an input amplifier 30 for amplifying analog network signals received from the telephone medium, such as the network signals shown in Figure 2C. The physical layer transceiver 20 also includes a signal conditioning circuit 32 that includes an envelope detection circuit 34 and an energy detection circuit 36. The envelope detection circuit 34 is responsive to the amplified received signal 26 to generate the envelope signal 28. For example, the envelope detector 34 includes an absolute value circuit (e.g., a rectifier circuit)

that generates an absolute value signal 39 representing the absolute value of the amplified received signal 26, and a low pass filter coupled to the rectifier circuit for filtering out high-frequency components of the rectified signal, resulting in the envelope signal 28. The envelope signal 28 is output from the envelope detector 34 and supplied to the energy detector 36. The energy detector 36 includes an integrator that performs the mathematical process of integration of the envelope signal 28 over time to produce a signal proportional to energy of the received pulse signal.

The physical layer transceiver 20 also includes slicer circuits 38a, 38b, 38c and 38d, and a digital to analog (D/A) converter 40 for supplying analog threshold signals to the slicer circuits 38. Further, the physical layer transceiver 20 includes a digital controller 41 configured for controlling the digital analog converter 40 to output threshold signals supplied to the slicer circuits 38, and a transmitter portion 52 (e.g., an output current amplifier), that converts transmit data (TxD) produced by the digital controller 41 to an analog network signal. The analog network signal is output at a selected one of 128 output gain values based on a 7-bit transmit gain (TxGain) signal output by the digital controller 41.

The reception characteristics, such as the gain of the input amplifier 30, substantially vary from one transceiver chip to another depending on various process parameters. For example, the receiver gain may vary by up to 50%.

Therefore, there is a need for calibrating the receiver circuit to a predetermined level, in order to maintain consistent reception characteristics of all physical layer transceivers in the network 10.

In particular, in accordance with the present invention, the input amplifier 34 is calibrated during an initialization period, for example, at power-up. A known transmit signal at the output of the transmitter 52 may be used as a calibration signal. For example, access identification (AID) transmit pulses formed by the transmitter 52 may be used as a calibration pulse stream. In response to the AID

pulses of a selected level, the gain of the input amplifier is adjusted to an optimum value that provides a predetermined signal level at the output of the envelope detector 34 or energy detector 36.

As shown in Figure 5 that illustrates the self-calibration procedure of the present invention, at power-up or during an initialization procedure, the digital controller 41 sets the transmit gain control signal TxGain to a selected value that provides a desired output of the transmitter 52 (block 102). For example, the output of the transmitter 52 may be set to a level corresponding to the maximum value in the dynamic range (i.e., linear region) of the receiver circuitry.

The peak amplitude of the AID envelope pulse produced at the output of the envelope detector 34 is compared by the slicer circuit 38a with the input amplifier test level (block 110). If the digital controller 41 detects that the value of the envelope pulse exceeds the test level, it lowers the gain of the input amplifier 30 by reducing the gain control value supplied to the input amplifier 30 (block 112). If the peak value of the envelope pulse is less than the input amplifier test level, the digital controller 41 raises the gain of the input amplifier 30 (block 114). The input amplifier gain control procedure is performed until the digital controller detects that a pulse test number (PTN) that defines the maximum number of iterations in the successive approximation algorithm is equal to 0.

Hence, at power-up or during the initialization procedure, a known level of AID pulses produced by the transmitter 52 is used by the physical layer transceiver 20 of the present invention to calibrate the input amplifier 30 by adjusting its gain to a fixed optimum level, for example, corresponding to the maximum level of the reception dynamic range. As a result, the present invention reduces the effects of process variations that limit the receiver sensitivity.

**Grounds of Rejection To Be Reviewed By Appeal**

Whether claims 1, 2, and 5-11 are anticipated by Roberts et al. under 35 U.S.C. 102(b).

**Argument**

Anticipation, under 35 U.S.C. § 102, requires that each element of a claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983); *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1920 (Fed. Cir. 1989) *cert. denied*, 110 S.Ct. 154 (1989). The term "anticipation," in the sense of 35 U.S.C. 102, has acquired the accepted definition meaning "the disclosure in the prior art of a thing substantially identical with the claimed invention." *In re Schaumann*, 572 F.2d 312, 197 USPQ 5 (CCPA 1978). The initial burden of establishing a basis for denying patentability to a claimed invention rests upon the Examiner. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985); *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984). To satisfy this burden, therefore, each and every element of the claimed invention must be shown by the Examiner to be disclosed in Roberts. Appellant respectfully asserts that the record fails to meet this requirement.

In particular, claim 1 recites a method of configuring a transceiver for providing data communications via residential telephone line wiring, the method comprising the steps of: transmitting a pulse signal having a selected amplitude by a transmit section of the transceiver, receiving the pulse signal by an input circuit in a receiver section of the transceiver to produce a receive signal representing the pulse signal, and adjusting gain of the input circuit so as to produce the receive signal at a predetermined level.

Independent claim 8 recites a transceiver for providing data communications over residential telephone line wiring, comprising:

an input circuit for receiving an incoming signal,  
an output circuit for transmitting a transmit signal having a selected amplitude, and  
a calibration circuit responsive to a receive signal produced by the input circuit in response to the transmit signal for adjusting gain of the input circuit so as to set the receive signal to a predetermined level.

It is respectfully submitted that the reference does not disclose configuring a transceiver for providing data communications via residential telephone line wiring, as claim 1 requires, or the transceiver for providing data communications over residential telephone line wiring recited in claim 8.

Considering the reference, Roberts discloses an equalization system for equalizing modem receivers and transmitters in a local area network 10. Each modem includes a transmitter, a receiver and a microcomputer.

The reference does not disclose providing data communications over residential telephone line wiring, as the claims require. Instead, Roberts indicates that the modems transmit and receive data over a cable television (CATV) system (col. 1, lines 12-37, col. 2, lines 43-45). As one skilled in the art would realize, data communications in the CATV system is provided over coaxial cables rather than residential telephone line wiring, as the claims require.

The Examiner takes the position that “it is inherent that telephone communication is provided over CATV wiring.” Therefore, the Examiner concludes that “Roberts discloses a process for configuring a transceiver for providing data communications via residential telephone wiring.”

The Examiner’s position of inherency is respectfully traversed for the following reasons.

It is well settled that to establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probability or possibilities. *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

However, the Examiner provides no evidence that the claimed transceiver for providing data communications via residential telephone line wiring, or the claimed process for configuring a transceiver for providing data communications via residential telephone line wiring is **necessarily** present in the Robert's system.

Moreover, one skilled in the art would realize that a cable TV system of Roberts does not include and does not need to include telephone line wiring. The reference provides no suggestion to use a residential telephone line wiring in a cable TV system. Therefore, the system of Roberts does not necessarily include the transceiver for providing data communications via residential telephone line wiring, having elements recited in claim 8, or the transceiver configured for providing data communications via residential telephone line wiring in the manner required in claim 1.

Accordingly, it cannot be said that Roberts inherently discloses the claimed transceiver or process.

It is noted that the Examiner's assertion that "it is inherent that telephone communication is provided over CATV wiring" is unwarranted. As one skilled in the art would realize the CATV cable

does not **necessarily** provide telephone communication. Therefore, telephone communication is not inherent to the CATV system of Roberts.

Moreover, even if a CATV cable provides telephone communication, it does not provide this communication via residential telephone line wiring, as the claims require.

Therefore, there is no reason to conclude that the Roberts CATV system includes the transceiver for providing data communications via residential telephone line wiring, having elements recited in claim 8, or the transceiver configured for providing data communications via residential telephone line wiring in the manner required in claim 1.

Hence, Roberts neither expressly nor inherently discloses the transceiver for providing data communications via residential telephone line wiring, having elements recited in claim 8, or the transceiver configured for providing data communications via residential telephone line wiring in the manner required in claim 1.

Moreover, Roberts does not disclose transmission and reception of a pulse signal for calibrating the receiver, as claim 1 requires. Instead, the reference discloses tuning the receiver to a calibration tone frequency, and comparing an energy-related parameters of the calibration signal with a reference signal.

Claims 2, 5-7 and 9-11 respectively dependent from claims 1 and 8 also recite elements of the process for configuring a transceiver for providing data communications via residential telephone line wiring or elements of the claimed transceiver for providing data communications via residential telephone line wiring. Therefore, these claims are not anticipated by Roberts.

Moreover, the Examiner does not address limitations of claims 9-11 dependent from claim 8.

However, Roberts does not disclose:

- the input circuit including an input amplifier for amplifying the incoming signal and an envelope detector for producing an envelope signal representing the incoming signal, as claim 9 requires; and

the transmit signal comprising a plurality of identification pulses for identifying a transmitting station, as claim 11 requires.

Accordingly, Roberts does not describe the subject matter of claims 1, 2, 5-11 within the meaning of 35 U.S.C. § 102.

**Conclusion**

For all of the foregoing reason, Appellant respectfully submits that the grounds of rejection of the claims on appeal is in error and should be reversed.

Respectfully submitted,

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**CLAIMS APPENDIX**

1. (Previously presented) A method of configuring a transceiver for providing data communications via residential telephone line wiring, the method comprising the steps of:
  - transmitting a pulse signal having a selected amplitude by a transmit section of the transceiver,
  - receiving the pulse signal by an input circuit in a receiver section of the transceiver to produce a receive signal representing the pulse signal, and
  - adjusting gain of the input circuit so as to produce the receive signal at a predetermined level.
2. (Original) The method of claim 1, wherein the gain of the input circuit is adjusted to a fixed level during initialization of the transceiver.
5. (Original) The method of claim 1, wherein the step of adjusting gain comprises comparing amplitude of the receive signal with a preset threshold level.
6. (Original) The method of claim 5, wherein the gain is reduced if the amplitude of the receive signal exceeds the threshold level.
7. (Original) The method of claim 6, wherein the gain is increased if the amplitude of the receive signal is less than the threshold level.
8. (Previously presented) A transceiver for providing data communications over residential telephone line wiring, comprising:
  - an input circuit for receiving an incoming signal,

an output circuit for transmitting a transmit signal having a selected amplitude, and a calibration circuit responsive to a receive signal produced by the input circuit in response to the transmit signal for adjusting gain of the input circuit so as to set the receive signal to a predetermined level.

9. (Original) The transceiver of claim 8, wherein the input circuit includes an input amplifier for amplifying the incoming signal and an envelope detector for producing an envelope signal representing the incoming signal.

10. (Original) The transceiver of claim 9, wherein the calibration circuit is configured for adjusting gain of the input amplifier.

11. (Original) The transceiver of claim 8, wherein the transmit signal comprises a plurality of identification pulses for identifying a transmitting station.

**EVIDENCE APPENDIX**

Non-applicable

**RELATED PROCEEDINGS APPENDIX**

Non-applicable